

Alternative Filters

Thursday, July 28, 2022 5:09 PM

- What I've found so far (as of August 11, 2022)
 - TL;DR
 - Change your filters on time based on how much water you use!
 - A note about plastic components in filters, especially portable filters
 - Do not expose them to sunlight or heat
 - Or alcohol or acidic liquids, but that's unlikely to happen
 - If you need to wash them off, do so with cool-to-warm water and mild soap
 - Products
 - Aquasana is a good company.
 - <https://www.aquasana.com/countertop-water-filters/claryum-countertop-100236126.html>
 - This unit did well in Dr. Knappe's team's study - <https://www.aquasana.com/under-sink-water-filters/reverse-osmosis-claryum/brushed-nickel-100236725.html>
 - Culligan International seems like a good company
 - ZeroWater is at least one good division/brand of Culligan - I've not looked into the others as thoroughly
 - <https://zerowater.com/collections/water-filter-pitchers-dispensers>
 - I'm considering buying one of their more portable pour-through filters, but I need their short-chain PFAS results.
 - Clearly Filtered is a good company - at least their pour-through pitcher
 - <https://www.clearlyfiltered.com/products/clean-water-pitcher>
 - They do sell an under-sink version, but I haven't looked into that, I've only looked at the more portable pitcher version
 - If ZW doesn't get back to me with their short-chain PFAS results, I'm going to purchase this CF filter for travel.
 - Dr. Knappe recommends these two
 - WP500313 WP2-LCV by Watts
 - <https://www.amazon.com/Watts-WP500313-Undercounter-Reducing-Drinking/dp/B0018MXH04/>
 - <https://www.premierh2o.com/collections/drinking-water-solutions/products/500313-wp-2-lcv>
 - He uses this one in his house
 - No NSF cert
 - Dr. Knappe probably opted for this one, despite the lack of NSF cert, because
 - his own studies show that it filters short-chain PFAS, which are harder to filter than long-chain PFAS.
 - The NSF does not yet have a standard for short-chain PFAS
 - The NSF standard is for 70 ppt for long-chain PFAS, but this filter Dr. Knappe uses filtered to 1 ppt or less.
 - More affordable, and he seems dedicated to helping the average rural North Carolinian, so affordability is key
 - ROES-50 by APEC (one of Culligan's divisions/brands)
 - <https://www.amazon.com/APEC-5-Stage-Reverse-Drinking-Water/dp/B0010ZGOZM/>
 - <https://www.freedrinkingwater.com/roes-50.htm>
 - Has NSF cert through WQA
 - But, it also filters short-chain PFAS to 1 ppt or less
 - Extra info for reference
 - Dr. Knappe's team's study
 - <https://pubs.acs.org/doi/full/10.1021/acs.estlett.0c00004>
 - Table at the end of this document shows brand names and their relative performance
 - https://pubs.acs.org/doi/suppl/10.1021/acs.estlett.0c00004/suppl_file/ez0c00004_si_001.pdf
- ...
 - Longer version
 - NSF/ANSI seem to be the groups that set the Standards, and any group can become NSF/ANSI accredited to certify that products meet one or more of these Standards for one or more contaminants
 - Two most common standards
 - NSF Standard 53 is the main one for water filters generally
 - NSF Standard 58 is the main one for RO filtering systems
 - There are other standards, but these are the two main USA standards for water filter systems in a house
 - Certifiers
 - NSF
 - <https://info.nsf.org/Certified/DWTU/>
 - WQA

- <https://wqa.org/find-products#/>
 - UL
 - Maybe this is it - <https://productiq.ulprospector.com/en>
 - Not very detailed search options
 - Poking around, it doesn't seem like they certify anything other than filtering components
 - Canadian Standards Association (CSA)
 - Search for products here - <https://www.csagroup.org/testing-certification/product-listing/>
 - Product area = Plumbing
 - Class numbers
 - 6811-42
 - Aesthetic Effects - Certified to NSF/ANSI 42
 - 6811-43
 - Certified to CSA B483.1
 - I do not know how stringent this is
 - 6811-53
 - Health Effects - Certified to NSF/ANSI 53
 - 6811-58
 - DWTU-REVERSE OSMOSIS DRINKING - WATER SYSTEMS - Certified to NSF/ANSI 58
 - 6853-01
 - NSF/ANSI/CAN 372 - Low Lead Content
 - 6861-07
 - Certified to NSF/ANSI/CAN 61 Section 7
 - 6861-08
 - Certified to NSF/ANSI/CAN 61 Section 8
 - 6861-09
 - Certified to NSF/ANSI/CAN 61 SECTION 9
 - <https://www.csagroup.org/testing-certification/product-areas/plumbing/water-quality-and-health-effects/>
 - For plumbing supply fittings:
 - NSF/ANSI 372 lead testing in drinking water for supply fittings & pipes
 - NSF/ANSI/CAN 61 toxicology testing of drinking water for supply fittings & pipes
 - ASME A112.18.1/CSA B125.1 plumbing supply fittings
 - ■ CSA B483.1 and NSF/ANSI 42, 44, 53, 55, and 58 for drinking water treatment units
 - For electrical plumbing components:
 - C22.2 No. 139
 - C22.2 No. 218
 - UL429 For drinking water
- | STANDARD | STANDARD DESCRIPTION |
|-----------------|---|
| NSF/ANSI Series | |
| NSF/ANSI 42 | Drinking Water Treatment Units - Aesthetic Effects |
| NSF/ANSI 44 | Residential Cation Exchange Water Softeners |
| NSF/ANSI 53 | Drinking Water Treatment Units - Health Effects |
| NSF/ANSI 55 | Ultraviolet Microbiological Water Treatment Systems |
| NSF/ANSI 58 | Reverse Osmosis Water Treatment Systems |
| NSF/ANSI 60 | Drinking Water Treatment Chemicals - Health Effects |
| NSF/ANSI 61 | Drinking Water System Components - Health Effects |
| NSF/ANSI 372 | Drinking Water System Components - Lead Content |
| CSA B483 Series | |
| CSA B483.1 | Drinking Water Treatment |
- CSA B483.1
 - <https://www.csagroup.org/store/product/CSA%20B483.1%3A21/>
 - I can't access it, so I don't know how rigorous it is
 - International Association of Plumbing and Mechanical Officials (IAPMO)
 - <https://pld.iapmo.org/>
 - They seem to certify lots of different things related to plumbing and HVAC
 - As far as residential water filtration, I only see three companies when I search "filter" for Product Description
 - However, these are not all to NSF/ANSI standards, they are to various other standards

- Watts
 - https://pld.iapmo.org/file_info.asp?file_no=0004116
 - Standard: IAPMO IGC 159-2019
 - This is a zero waste water RO system, or retrofit kits to do the same - <https://webstore.ansi.org/Standards/IAPMO/IAPMOIGC1592019>
 - (Although that water has to go somewhere with all of those contaminants - where will it go?)
- Rayne Corp
 - https://pld.iapmo.org/file_info.asp?file_no=0010494
 - Standard: WQA S-200-2000
 - Appears to be Residential and Commercial Water Filters, a WQA standard - <https://www.wqa.org/programs-services/product-certification/product-certification-areas/standards>
 - Here is an old 1988 version of the standard
 - <https://archive.org/details/gov.law.wqa.s-200.1988/page/n1/mode/2up>
- Aquathin Corp
 - https://pld.iapmo.org/file_info.asp?file_no=0009853
 - – Standard: WQA S-200-2000
 - See aforementioned
- Truesdail
 - <https://www.truesdail.com/product-listings-search/>
 - They appear to only do
 - NSF 61
 - Sections 4-9
 - <https://www.nsf.org/knowledge-library/nsf-ansi-standard-61-drinking-water-system-components-health-effects>
 - This standard covers health effects of drinking water systems
 - Make sure that no, or not much, bad stuff gets into the water from the drinking system itself
 - NSF 372
 - <https://www.nsf.org/knowledge-library/nsf-ansi-can-372-technical-requirements>
 - Make sure there's no lead in the drinking water system
 - ASSE 1022
 - <https://assewebstore.com/asse-standard-1022-2021/>
 - It's a standard for beverage dispenser systems
- What's important to me
 - NSF/ANSI standards are met
 - Or, an eminent and objective expert, or several of them, have recommendations and data showing why, regardless of NSF/ANSI standards
 - Company seems to be telling the truth and desire to be honest with consumers
 - Contaminants
 - In-house in USA
 - PFAS/PFOA/PFOS are filtered
 - I've looked primarily at filters that at least include this
 - This is my benchmark contaminant
 - Heavy metals
 - VOCs
 - Radium
 - Outside of USA and raw outside water
 - Aforementioned
 - Bacteria and other microbes
 - Lifetime of the filter
 - "Service cycle" is what NSF calls it
 - Important in considering the price per gallon
 - How many components of the system have to be replaced?
 - How frequently?
 - Price for replacement filters
- Note on RO
 - I read a comment on Project Farm's Patreon page from a commenter who claimed to be water quality expert that minerals removed by RO, and even distillation, is not an issue if we eat a nutritious and balanced diet.
 - We get the minerals from food, primarily
 - I then encountered the same idea on this page (this company has one product that Dr. Knappe recommends, so that boosts my trust in them a tiny bit) - <https://www.freedrinkingwater.com/faq.htm#MINCON>
- Dr. Detlef Knappe is at the forefront of research to protect North Carolina residents from PFAS
 - [Water Wednesday: July 26, 2017 - Just the Facts Please: An Evening with Scientists](#)
 - In this talk, Dr. Knappe and Dr. Smart both make comments that are important to me
 - Dr. Smart

- it is likely that most people on the planet, including the US, have higher levels of many contaminants than we should
 - Industrial compounds should be assumed toxic until proven otherwise
 - Dr. Knappe and Dr. Smart
 - There are unknown, unregulated contaminants in the environment
 - (I encountered this in the EPA national water report I read back in 2014 - and cannot find again, ugh! - about unknown chemicals in Minnesota)
 - Dr. Knappe
 - He said he follows the "precautionary principle," and errs a little more on the side of filtering too much
 - He recommends RO system for those who want the best filtering generally
 - But only for water that will be ingested
 - He doesn't think RO is needed for whole-house use
 - NOTE - It is important to change filters on time. If not, they are probably not filtering the water, and they give a false sense of security.
 - Change filters on time based off of how much water you typically use.
 - Recommendations
 - I emailed Susan Richardson at USC Columbia what filters she recommends, and she said that generally speaking, any NSF certified filter, at any level, is going to afford decent filtering capabilities. She didn't know about PFAS, though, so she emailed Dr. Knappe
 - He recommended two
 - ROES-50 by APEC
 - <https://www.amazon.com/APEC-5-Stage-Reverse-Drinking-Water/dp/B0010ZGOZM/>
 - <https://www.freedrinkingwater.com/roes-50.htm>
 - It's a multi-stage system, including RO
 - Under-sink
 - What I found
 - Only certified for Total Dissolved Solids (TDS) by WQA to NSF Standard 58
 - https://wqa.org/find-products/ctl/detail/mid/1054/cid/apec_water_systems/sid/5/keyword/apec
 - Yet, Knappe's lab found it was effective for PFAS
 - WP500313 WP2-LCV by Watts
 - <https://www.amazon.com/Watts-WP500313-Undercounter-Reducing-Drinking/dp/B0018MXH04/>
 - <https://www.premierh2o.com/collections/drinking-water-solutions/products/500313-wp-2-lcv>
 - It's a two-stage
 - Under-sink
 - No certs that I can find!
 - WQA doesn't have any for this model
 - <https://wqa.org/find-products/ctl/detail/mid/1054/cid/watts/sid/3/keyword/premier>
 - https://wqa.org/find-products/ctl/detail/mid/1054/cid/watts_premier_inc/sid/29/keyword/premier
 - None at NSF
 - Others?
 - I need to look at UL, IAMPO, CSA, and Truesdail
- Dr. Knappe said he uses this one in his house
 - I guess he has that much confidence in his lab's test results
 - I guess he is that unconcerned about what contaminants, at what levels, he may encounter by not having the best filter ever
 - \$ cost must be a significant enough factor for him and his family
- I searched the NSF and WQA certification sites (linked above) using the "what's important to me" as my lens.
 - Summary
 - Products
 - Aquasana is a good company.
 - <https://www.aquasana.com/countertop-water-filters/claryum-countertop-100236126.html>
 - ZeroWater is a good company
 - <https://zerowater.com/collections/water-filter-pitchers-dispensers>
 - Clearly Filtered is beginning to seem good to me, but they have a couple of questions to answer before I trust them as much as other companies
 - <https://www.clearlyfiltered.com/products/clean-water-pitcher>
 - I don't know how to search UL yet
 - I also don't know if there are other certifiers out there that might have searchable certification lists
 - We live at the Greens and are in "stay portable" mode, so I did not look at under-sink options.
 - Too long, but still want to read

- NSF Standard 58 (for RO systems)
 - NSF
 - Counter-top connected to sink faucet
 - None
 - Counter-top manual fill
 - None for 58
 - Shower filter
 - None for 58
 - Sports Bottle
 - None for 58
 - Pour through
 - That's not how RO works I guess
 - Faucet mount
 - Not how RO works
 - WQA
 - (I'm just looking at ones that filter PFOS/PFOA)
 - Coway Co
 - Counter-top is option
 - https://wqa.org/find-products/ctl/detail/mid/1054/cid/coway_co_ltd/sid/5
 - <https://coway-usa.com/en/countertop/Prime-Water-Purifier>
 - Whoa, you have to lease them
 - Kinetico Inc
 - No counter top
 - NSF Standard 53
 - NSF
 - Types
 - Counter-Top manual fill
 - <https://info.nsf.org/Certified/DWTU/Listings.asp?TradeName=&Standard=053&ProductType=Counter-Top+Manual+Fill&PlantState=&PlantCountry=&PlantRegion=&submit3=Search&hdModlStd=ModlStd>
 - Only two companies
 - Aquasana
 - All models 320 gallons service cycle
 - Asbestos Reduction
 - Cyst Reduction
 - Lead Reduction
 - Mercury Reduction
 - MTBE Reduction
 - Turbidity Reduction
 - VOC Reduction **
 - PFOA Reduction
 - PFOS Reduction
 - A.O. Smith Corporation
 - All models 320 gallons service cycle
 - They have a counter top
 - Wait...it appears to own Aquasana, it's the same thing
 - Shower filter
 - None for Standard 53
 - Sports Bottle
 - None for Standard 53
 - Pour-Through (like the Brita style pitcher)
 - <https://info.nsf.org/Certified/DWTU/Listings.asp?TradeName=&Standard=053&ProductType=Pour+Through&PlantState=&PlantCountry=&PlantRegion=&submit3=Search&hdModlStd=ModlStd>
 - The only one rated for PFOA/PFOS is Zero Water
 - Service cycle is 20 gallons
 - <https://zerowater.com/pages/results>
 - They seem pretty dang honest
 - https://cdn.shopify.com/s/files/1/0311/5499/5336/files/Performance_Data_Sheet_for_all_certified_devices_10-12-20.pdf?v=1605213179
 - No viruses or bacteria
 - 2 gallons per day flow rate
 - You can get away with filtering 40 gallons
 - \$444/year using 4 gallons per day
 - If only 20 gallons
 - \$888/year using 4 gallons per day
 - What kind of material is used for the pitcher?

- WQA
 - <https://wqa.org/find-products#/keyword/?standards=3,5&categories=5>
 - A.O. Smith
 - https://wqa.org/find-products/ctl/detail/mid/1054/cid/ao_smith/sid/3
 - Plumbed in to separate tap
 - Aquasana
 - https://wqa.org/find-products/ctl/detail/mid/1054/cid/aquasana_inc/sid/3
 - Counter top
 - <https://www.aquasana.com/countertop-water-filters/clean-water-machine/black-100348638.html>
 - Also on NSF
 - <https://info.nsf.org/Certified/DWTU/Listings.asp?TradeName=&Standard=053&ProductType=&PlantState=&PlantCountry=&PlantRegion=&submit3=Search&hdModlStd=ModlStd>
 - 320 gallon sc
 - <https://www.aquasana.com/water-filter-replacements/countertop-water-filter-replacements/new-cwm-lead-filter-replacement-2-pack-100350840.html>
 - 0.5 gallons per minute
 - 300 gallons per filter
 - $300/4=75$ days with one filter
 - $365/75=4.8667$ filters per year
 - 2 filters = \$60
 - $4.9/2=2.45$
 - $2.45*60=\$147.00$ per year
 - <https://manuals.plus/aquasana/aq-cwm2-b-clean-water-machine-manual>
 - It does not filter microbes, have to disinfect the water first if there are microbes
 - Aquasana also has a portable connect to faucet model, and it's NSF rated for all the same contaminants as the other one, PFOA/PFOS
 - <https://info.nsf.org/Certified/DWTU/Listings.asp?TradeName=AQ-4035&Standard=&ProductType=&PlantState=&PlantCountry=&PlantRegion=&submit3=Search&hdModlStd=ModlStd>
 - 0.5 gallons per minute
 - <https://www.aquasana.com/countertop-water-filters/claryum-countertop-100236126.html>
 - AQ-4000W
 - No viruses or bacteria, have to disinfect the water first
 - 450 gallons service cycle
 - $450/4=112.5$ days
 - $365/112.5=3.2444$
 - $3.2444*60=194.664$
 - \$195/year
 - Brondell
 - https://wqa.org/find-products/ctl/detail/mid/1054/cid/brondell_inc/sid/3
 - Under sink
 - Clearly Filtered
 - https://wqa.org/find-products/ctl/detail/mid/1054/cid/clearly_filtered_inc/sid/3
 - Water pitcher
 - \$670/year using 4 gallons per day
 - Only certified for PFOS and PFOA, nothing else
 - 100 gallon sc
 - Can store it if you dry the used filter out and leave it in the fridge - <https://help.clearlyfiltered.com/article/x9an75dqui-i-m-going-on-vacation-how-do-i-store-my-filter-while-i-am-away>
 - It's pitcher is made of plastic
 - Tritan
 - (Research I've done elsewhere on Tritan with Blenders) - It is

relatively stable, but it has problems of its own with hormone-disruption and immune system harm

- Especially if exposed to saline, alcohol, heat, or UV
 - Heat and UV are the only real dangers I can think of with a water filter pitcher.

• <https://www.clearlyfiltered.com/products/clean-water-pitcher-replacement-filter-6-pack>

- They say that a filter lasts 100 gallons, but that if you live in a large or old city, or you have heavily contaminated water, the life of the filter will be shorter
 - I just used contact form to ask them how you can know when to replace a filter (sooner, I assume) when you've been using heavily contaminated water
 - 7-30-22
 - They wrote back and said when the filter "slows down"
 - I'm now asking about old contaminants being pushed out or let through

• <https://www.clearlyfiltered.com/products/clean-water-pitcher>

- This sounds bogus - they claim to filter things and meet NSF standards that are not backed up by the certifying bodies
 - It says "Intelligent technology does not target beneficial minerals and allows them to pass through."
 - They don't have any listing on the NSF site
 - The WQA is for PFOS and PFOA
 - Are those good enough to constitute the rest of them?
 - I know Susan Richardson said there are long chain PFAS that are easier to filter, and short chain PFAS that are harder to filter
 - What are the short chain ones?
 - Is this why Dr. Knappe selected those other filters, because he trusted his own lab tests to show they filtered short-chain PFAS?
 - Where were their tests done?
 - They also claim to let the good minerals through
 - How? If you're catching heavy metals, aren't you catching good minerals, too?
 - They also say that ZeroWater doesn't filter PFOA
 - But it does - <https://info.nsf.org/Certified/DWTU/Listings.asp?>

[TradeName=&Standard=053&ProductType=Pour+Through&PlantState=&PlantCountry=&PlantRegion=&submit3=Search&hdModIStd=ModIStd](#)

- I used contact form to tell them they are not comparing rightly - 7-30-22
 - They thanked me for letting them know, and they are updating the info
- https://cdn.shopify.com/s/files/1/1011/0318/files/Printed_Testing_Data_Pitcher.pdf?v=1637960019
 - Well well well, ol' Jaime at EnviroTek, lol
 - Yep, Zinc and Copper are reduced, so it does not necessarily let all the potentially good stuff through, just some
 - Filters virus and bacteria
- Idk if it's certified, but they have a 20oz SS water bottle with 25 gallon sc
- I just contaced them about
 - "benefical minerals go through"
 - were test results to the 100 gallon mark
 - 7-30-22
 - They said it is to the 100 gallon mark
 - They said that more potassium, magnesium, and calcium stays in than gets captured
 - They said they don't "actively test for it" - but "they noticed" that's how it goes
 - >How do they know if they don't actively test?
 - He must mean in-house testing, or he's lying
- I'm contacting them again
 - I asked how they know about K, Mg, and Ca if they don't test for it
 - They said they do in-house testing
 - I asked about slowing filtering rate, and if it's always indicative of decreased filtering capability. Also, does filtering rate always decrease after 100 gallons, or can contaminants pass through even without a noticeable decrease in rate?
 - They said that slow filtering rate is not necessarily indicative of a used-up filter and should not be trusted, instead measure how much water you filter and replace after 100 gallons
 - They said for municipalites or locations with a lot of contaminants, they just work with you to guess.
 - They are also working on coming up with benchmark contaminant levels and filter lives for major cities.
- I reached out again to ask about storing the filter on trips
 - They said dried it out, store in dark, cool container, and make sure you replace it by 100 gallons, or 6 months, whichever is sooner
 - The 6 months is for mold or bacteria
- Culligan
 - Aquasential
 - https://wqa.org/find-products/ctl/detail/mid/1054/cid/culligan_internation/sid/3
 - POU, faucet mount
- Franklin Water Treatment
 - Micromax 8500
 - https://wqa.org/find-products/ctl/detail/mid/1054/cid/franklin_water_treat/sid/3
 - Under sink
- Zero Technologies
 - Zero Water

- https://wqa.org/find-products/ctl/detail/mid/1054/cid/zero_technologies/sid/3
 - POU, it's faucet mount
 - Tupperware China
 - https://wqa.org/find-products/ctl/detail/mid/1054/cid/tupperware_china/sid/3
 - POU: Nano Nature
 - <https://www.tupperware2u.com/product-category/nano-nature/>
 - Looks like you get it from China, or Malaysia
- PFAS
 - Dr. Richardson said short-chain PFAS are harder to filter than long-chain PFAS
 - With this in mind, Dr. Knappe still recommended the two filters he did
 - More info on the short-chain PFAS
 - <https://www.ewg.org/news-insights/news/fda-studies-short-chain-pfas-chemicals-more-toxic-previously-thought>
 - <https://news.bloomberglaw.com/environment-and-energy/insight-the-case-for-regulating-all-pfas-chemicals-as-a-class>
 - Does NSF test for short-chain?
 - <https://www.nsf.org/blog/consumer/treat-pfas-drinking-water>
 - August 2021
 - Doesn't mention short-chain or long-chain
 - Yikes, they only rate down to 70 ppt
 - EWG recommends 1 ppt
 - The other NSF funded a Knappe study to see if some special filters can capture PFAS well
 - <https://beta.nsf.gov/science-matters/engineers-studying-how-pfas-interact-environment>
 - https://www.nsf.gov/awardsearch/showAward?AWD_ID=1805315&HistoricalAwards=false
 - Study will be done July 31, 2021
 - In Dr. Knappe's student's study, are there any portable filters that did well?
 - Study
 - <https://pubs.acs.org/doi/full/10.1021/acs.estlett.0c00004>
 - All under-sink dual-stage and reverse osmosis filters tested showed near complete removal for all PFASs evaluated. In contrast, all other filters containing activated carbon exhibited variable PFAS removal. In these filters, PFAS removal efficiency was dependent on chain length, with long-chain PFASs (~60–70% removal) being more efficiently removed than short-chain PFASs (~40% removal). A few whole-house activated carbon POE systems ($n = 8$) were also evaluated; however, results were variable, and in some cases (four of eight systems), increased PFAS levels were observed in the filtered water.
 - So, under-sink dual-stage and RO filters did best with short-chain
 - They note that they also remove novel PFEAs, which are unknown chemicals
 - Short-chain PFAs mentioned
 - GenX
 - ADONA
 - F-53B
 - PFHxA
 - Maybe short-chain, maybe novel, maybe both
 - PFBA
 - PFHxS
 - Tables with brand names
 - https://pubs.acs.org/doi/suppl/10.1021/acs.estlett.0c00004/suppl_file/ez0c00004_si_001.pdf
 - The Aquasana Clean Water Machine, which uses the same filters as what we bought, was tested
 - Only tested once
 - 3 month old filters
 - Contaminants in ng/L
 - <https://www.epa.gov/sites/default/files/2015-09/documents/epa816f15001.pdf>
 - ng/L for water contaminant concentration is ppt
 - 1 ppt = 1 drop in 1 trillion gallons of water
 - short-chain and/or novel tested include
 - GenX
 - PFHxA
 - PFBA
 - PFHxS
 - Method detection limits (MDL)
 - GenX
 - Less than 0.01 ng/L (ppt)
 - PFHxA
 - 0.16 ng/L (ppt)
 - PFBA

- 0.14 ng/L (ppt)
- PFHxS
 - 0.11 ng/L (ppt)
- How did the Aquasana CWM do?
 - Reduced all of them below MDL, or below 1 ppt